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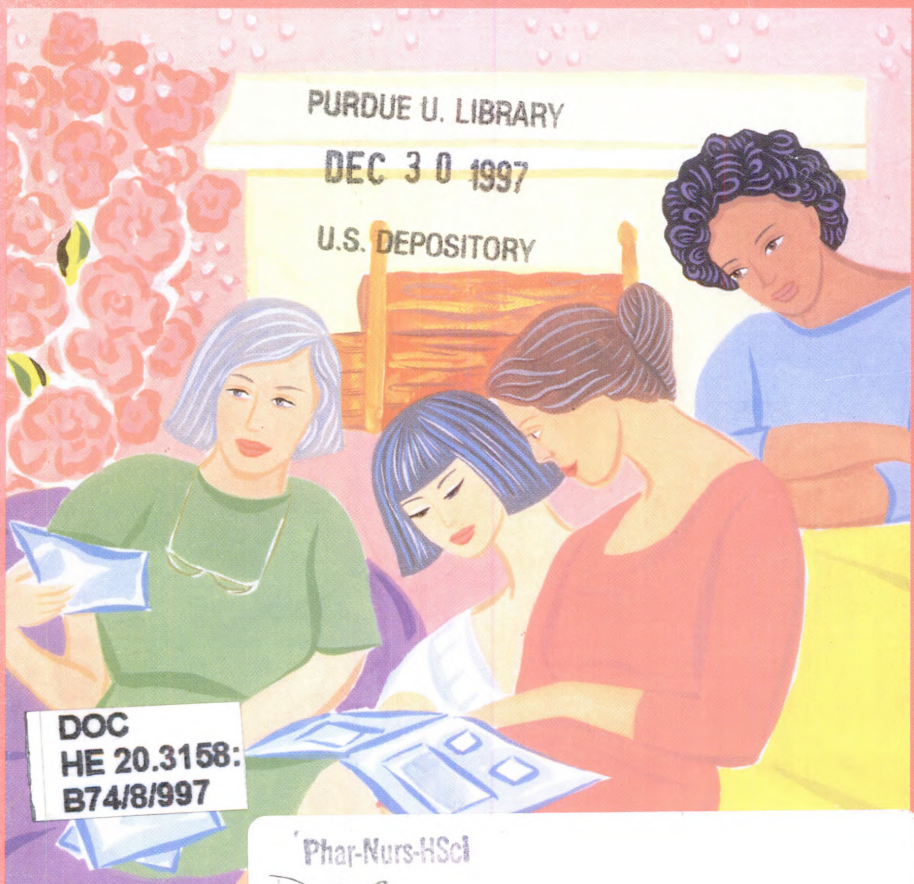
Understanding Breast Changes

~ A Health Guide for All Women ~



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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service • National Institutes of Health
National Cancer Institute

Dear Reader:

We are pleased that you have received a copy of this National Cancer Institute booklet. We hope you find it helpful.

We are always trying to improve our publications. The best way we can do this is by getting your reactions. At the end of this booklet, you will find a response card asking several questions. We would greatly appreciate your taking the time to fill this out and return it to us.

All of your responses will be treated confidentially. We welcome any other comments you may have.

Sincerely,

Office of Cancer Communications

THE X-RAYS

Understanding Breast Changes

~ A Health Guide for All Women ~

Breast cancer is hard to ignore. It is the most common form of cancer among American women, and almost everyone knows at least one person who has been treated for it.

Understandably, women are concerned about getting breast cancer, and this concern prompts them to watch for breast changes. Breast changes are common. Even though most are not cancer, they can be worrisome.

This booklet is designed to help you with these concerns. It describes screening for the early detection of breast cancer, explains the various types of breast changes that women experience, and outlines methods that doctors use to distinguish between benign (noncancerous) changes and cancer. It reviews factors that can increase a woman's cancer risk and reports on current approaches to breast cancer prevention. Words that appear **bold** on the pages that follow are defined in the Glossary that begins on page 43.

We hope that you will find the information in this booklet helpful.

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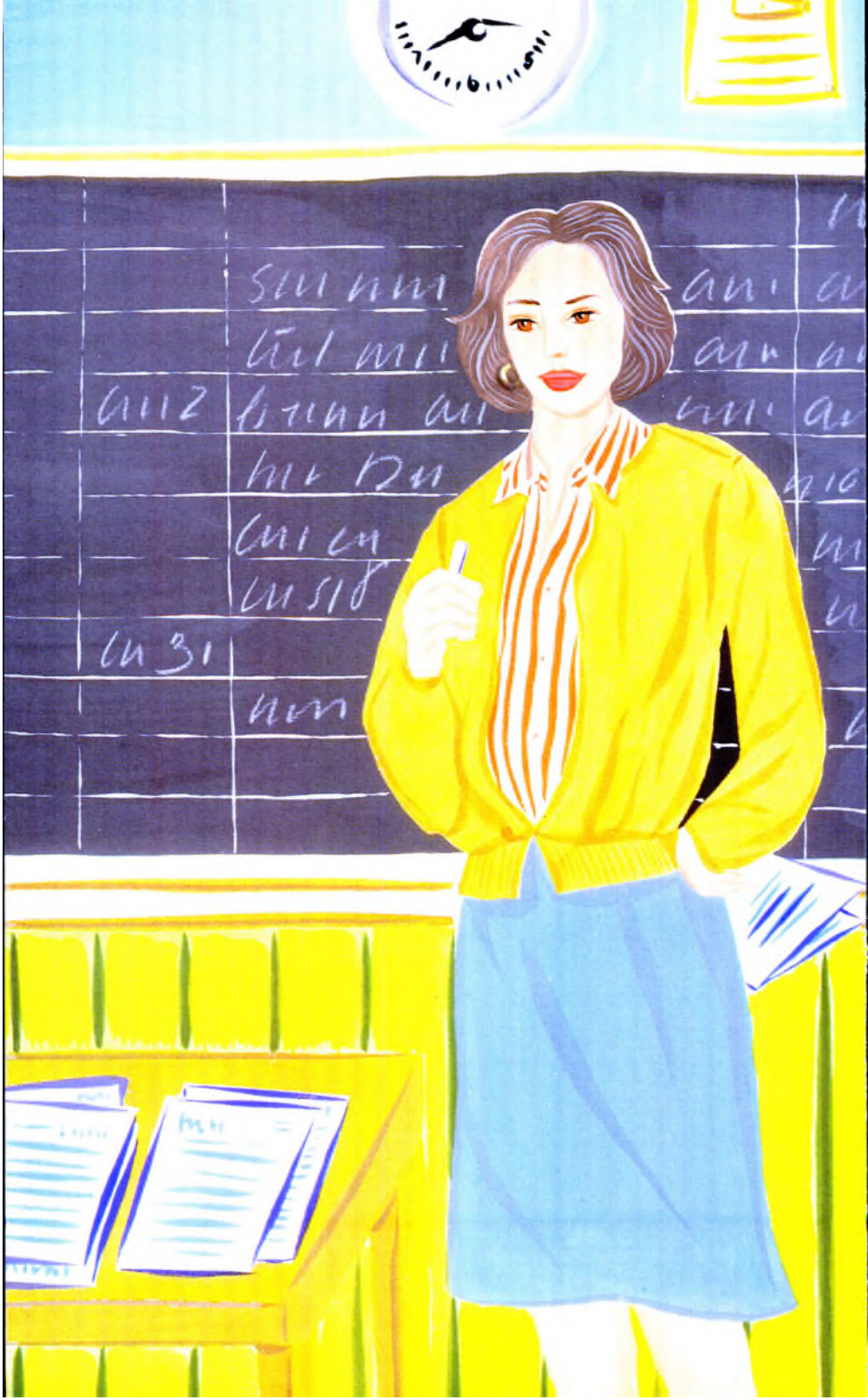
Breast Cancer: Status Report

This year in the United States an estimated 180,000 women will learn they have breast cancer. Three-fourths of the cases of breast cancer occur in women ages 50 or older, but it affects younger women, too (and about 1,400 men a year).

More women are getting breast cancer, but no one yet knows all the reasons why. Some of the increase can be traced to better ways of recognizing **cancer** and detecting cancers in an early stage. The increase also may be the result of changes in the way we live—postponing childbirth, taking replacement **hormones** and oral contraceptives, eating high-fat foods, or drinking more alcohol.

The encouraging news is that, more and more, breast cancer is being detected early, while the **tumor** is limited to the breast and very small. Currently, two-thirds of newly diagnosed breast cancers show no signs that the cancer has spread beyond the breast.

With prompt and appropriate treatment, the outlook for women with breast cancer is good. Moreover, a majority of women diagnosed with early stage breast cancer are candidates for treatment that saves the breast.



The Key: Early Detection

The key to finding breast cancer is early detection, and the key to early detection is screening: looking for cancer in women who have no symptoms of disease. The best available tool is a regular **screening mammogram—x-ray** of the breast—coupled with a **clinical breast exam**—by a doctor or nurse.

Mammography

A **mammogram** is an x-ray of the breast. Cancers that are found on mammograms but that cannot be felt (**nonpalpable cancers**) usually are smaller than cancers that can be felt, and they are less likely to have spread.

Mammography is not foolproof. Some breast changes, including lumps that can be felt, do not show up on a mammogram. Changes can be especially difficult to spot in the dense, glandular breasts of younger women. This is why women of all ages should have their breasts examined every year by a physician or trained health professional.

~ A lump should never be ignored just because it is not visible on a mammogram.~

Two Kinds of Mammography: Diagnostic and Screening

If a woman visits her doctor because of unusual breast changes such as a lump, pain, nipple thickening or discharge, or changes in

breast size or shape, or has a suspicious screening mammogram, the doctor often asks her to have a **diagnostic mammogram**: an x-ray of the breast to help assess her symptoms. A diagnostic mammogram is a basic medical tool, and it is appropriate for women of any age.

This booklet discusses screening mammograms: x-rays that are used to look for breast changes in women who have no signs of breast cancer. (Even though the woman has no symptoms of breast disease, a diagnosis of breast cancer can begin with a doctor checking a screening mammogram.)

What Are the Benefits of Screening Mammography?

High-quality mammography is the most effective tool now available to detect breast cancer early, before symptoms appear—often before a breast lump can even be felt. Regularly scheduled mammograms can decrease a woman's chance of dying from breast cancer. For some women, early detection may prevent the need to remove the entire breast or receive chemotherapy.

Who Benefits From Screening Mammography?

Studies done over the past 30 years clearly show that regular screening mammography significantly reduces the death rate from breast cancer in women over the age of 50. Recent results from studies show that regular mammography also reduces death rates from breast cancer in women who begin screening in their forties.

The effectiveness of mammography seems to increase as a woman ages, and the time it takes for benefits to emerge appears to take longer in younger women.

The two plates are then pressed together. The idea is to flatten the breast as much as possible; spreading the tissue out makes any abnormal details easier to spot with a minimum of radiation. The technologist takes the x-ray, then repeats the procedure for the next view.

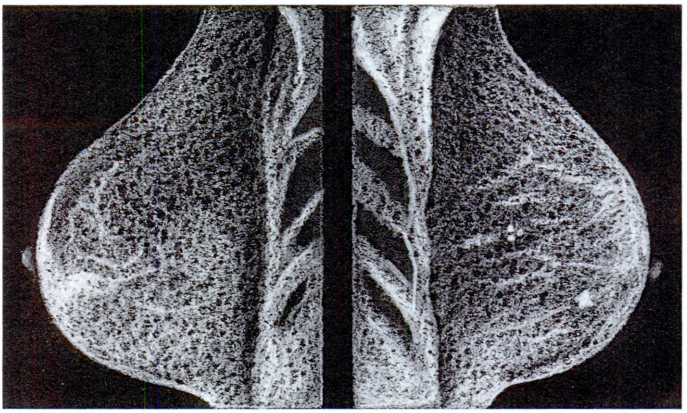
The pressure from the plates may be uncomfortable, or even somewhat painful. It helps to remember that each x-ray takes less than one minute—and it could save your life. It also helps to schedule mammography just after your period, when your breasts are least likely to be tender, or at the same time each year, if you no longer have your period.

Although some women are concerned about radiation exposure, the risk of any harm is extremely small. The doses of radiation used for mammography are very low and considered safe. The exact amount of radiation needed for a specific mammogram will depend on several factors. For instance, breasts that are large or dense will require higher doses to get a clear image. Federal mammography guidelines limit the radiation used for each exposure of the breast to 0.3 **rad**. (A "rad" is a unit of measurement that stands for **r**adiation **a**bsorbed **d**ose.) In practice, most mammograms deliver just a small fraction of this amount.

Specialized mammography facilities have experienced personnel as well as modern equipment that is custom designed for mammograms. The combination of good technology and expertise makes it possible to obtain good-quality x-ray images with very low doses of radiation.

Reading a Mammogram

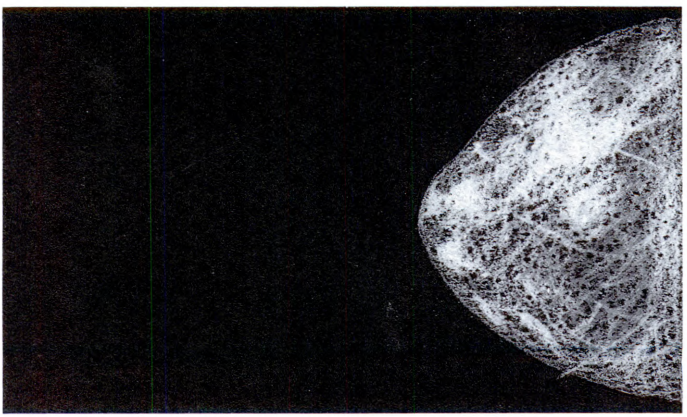
The mammogram is first checked by the technologist and then read by a diagnostic **radiologist**, a doctor who specializes in interpreting



The diagnostic radiologist looks for unusual shadows, masses, distortions, and differences between the two breasts.

x-rays. The radiologist looks for unusual shadows, masses, distortions, special patterns of tissue density, and differences between the two breasts. The shape of a mass can be important, too. A growth that is **benign** (noncancerous) such as a cyst, looks smooth and round and has a clearly defined edge. Breast cancer, in contrast, often has an irregular outline with finger-like extensions.

Many mammograms show nontransparent white specks. These are calcium deposits known as **calcifications**.



Macrocalcifications are usually associated with benign breast conditions; many clusters of microcalcifications in one area may be an early sign of breast cancer.

Macrocalcifications are coarse calcium deposits. They are often seen in both breasts. Macrocalcifications are most likely due to aging, old injuries, or inflammations. They usually are not signs of cancer.

Microcalcifications are tiny flecks of calcium found in an area of rapidly dividing cells. Clusters of numerous microcalcifications in one area can be a sign of ductal carcinoma in situ. (See *DCIS*, page 8.) About half of the cancers found by mammography are detected as clusters of microcalcifications.

Reporting the Results

The radiologist will report the findings from your mammogram directly to you or to your doctor, who will contact you with the results. If you need further tests or exams, your doctor will let you know. If you don't get a report, you should call and ask for the results.

~ Don't simply assume that the mammogram is normal if you do not receive the results. ~

Your mammograms are an important part of your health history. Being able to compare earlier mammograms with new ones helps your doctor evaluate areas that look suspicious. If you move, ask your radiologist for your films and hand-carry them to your new physician, so they can be kept with your file. Always make sure that the radiologist who reads your mammogram has the old films to use for comparison.

Mammograms and Breast Implants

A woman who has had **breast implants** should continue to have mammograms. (A woman who has had an implant following breast cancer surgery should ask her doctor whether a mammogram is still necessary.) However, the woman should inform the technologist and

radiologist beforehand and make sure they are experienced in x-raying patients with breast implants.

Because silicone implants are not transparent on x-ray, they can block a clear view of the tissues behind them. This is especially true if the implant has been placed in front of, rather than beneath, the chest muscles.

Experienced technologists and radiologists know how to carefully compress the breasts to avoid rupturing the implant. They can also use special techniques to detect abnormalities, sliding the implant backward against the chest wall, and pulling the breast tissue over and in front of it. Interpreting the mammogram can also be difficult, especially if scar tissue has formed around the implant or if silicone has leaked into nearby breast tissues.

Choose a Mammography Facility

Many places—breast clinics, radiology departments of hospitals, mobile vans, private radiology practices, doctors' offices—offer high-quality mammography. Your doctor can arrange for a mammogram for you, or you can schedule the appointment yourself. You can call NCI's Cancer Information Service (1-800-4-CANCER) to find a mammography facility in your community.

All facilities must be certified by the Food and Drug Administration (FDA). (See *Assuring High-Quality Mammography*, page 13.) Staff of the facility are required to post the FDA certificate in a prominent place; if you don't see it, you should ask about certification. Without the FDA "seal of approval," it is now illegal for mammographic facilities to operate.

Assuring High-Quality Mammography

To make sure that all women have access to high-quality mammography, a federal law—the Mammography Quality Standards Act—now requires all mammography facilities to be certified by the FDA. Each facility must demonstrate that it meets federal standards for equipment, personnel, and practices.

Equipment must be capable of producing high-quality mammograms with the lowest possible amount of radiation exposure. Furthermore, it must be regularly checked by a radiological physicist and adjusted as necessary to be sure that its measurements and doses are correct.

Doctors and other staff members must be specially trained to perform and interpret breast x-rays. The technologists who take mammograms are certified by the American Registry of Radiological Technologists or licensed by the state; the doctors who read mammograms should be board-certified radiologists who have taken special courses in mammography.

The regulations also specify that mammography facilities must perform mammography regularly and frequently, maintain quality assurance programs, and ensure proper and timely reporting of test results.

In addition to quality, another important consideration is cost. Most screening mammograms cost between $50 and $150. Most states now have laws requiring health insurance companies to reimburse all or part of the cost of screening mammograms; check with your insurance company. Medicare pays some of the cost for screening mammograms; check with your health care provider or call the Medicare Hotline (1-800-638-6833) for details.

Some health service agencies and some employers provide mammograms free or at low cost. Low cost does not mean low quality, however. A large government survey found that some of the facilities charging the lowest fees (often because they serve large numbers of women) were among the best in terms of complying with high-quality standards.

Your doctor, local health department, clinic, or chapter of the American Cancer Society, as well as NCI's Cancer Information Service at 1-800-4-CANCER (1-800-422-6237), may be able to direct you to low-cost programs in your area.

Schedule a Regular Mammogram

Early detection of breast cancer is crucial for successful treatment, and regular screening mammography is currently the best tool for early detection. A 1993 survey by the National Center for Health Statistics found that 60 percent of all women ages 40 to 49 got a mammogram in the preceding 2 years, and 65 percent of women ages 50 to 64 had done so, but only 54 percent of women ages 65 and over had been screened during that time. It is clear that many women still do not get mammograms at regular intervals. Sadly, the women least likely to have regular exams include those at highest risk, women ages 60 and older.

The reason women most frequently give for having—or not having—a mammogram is whether or not the doctor suggested it. Although surveys show that more doctors routinely advise women about mammography, some fail to do so—because they forget, or because they assume that another doctor has done so. If your doctor doesn't suggest mammography, it will be up to you to raise the issue.

Other Techniques for Detecting Breast Cancer

Clinical Breast Exam

Most professional medical organizations recommend that a woman have periodic breast exams by a doctor or nurse along with getting regular screening mammograms. You may find it convenient to schedule a breast exam during your routine physical.

The examiner will look at your breasts while you are sitting and while you are lying down. You may be asked to raise your arms over your head or let them hang by your sides, or to press your hands against your hips. The examiner checks your breasts carefully for changes in the skin such as dimpling, scaling, or puckering; any discharge from the nipples; or any difference in appearance between the two breasts, including differences in size or shape. The next step is **palpation**: Using the pads of the fingers to feel for lumps, the examiner will systematically inspect the entire breast, the underarm, and the collarbone area, first on one side, then on the other.

A lump is generally the size of a pea before a skilled examiner can detect it. Lumps that are soft, round, and smooth tend not to be cancerous. An irregular, hard lump that feels firmly anchored within

the breast tissue is more likely to be a cancer. However, these are general observations, not hard and fast rules.

~ The only sure way to know if a solid lump is cancer is to have some tissue removed and examined under the microscope. ~

A breast exam by a doctor or nurse can find some cancers missed by mammography, even very small ones. In addition to the skill and carefulness of the examiner, the success of a physical exam can be influenced by your monthly cycle and by the size of your breast, as well as by the size and location of the lump itself. Lumps are harder to find in a large breast.

Currently, mammography and breast exams by the doctor or nurse are the most common and useful techniques for finding breast cancer early. Other methods such as ultrasound may be helpful in clarifying the diagnosis for women who have suspicious breast changes. However, no other procedure has yet proven to be more effective than mammography for screening women with no symptoms; thus, most alternative methods of breast cancer detection are used primarily in medical research programs.

Ultrasound

Ultrasound works by sending high-frequency sound waves into the breast. The pattern of echoes from these sound waves is converted into an image (**sonogram**) of the breast's interior. Ultrasound, which is painless and harmless, can distinguish between tumors that are solid and cysts, which are filled with fluid. Sonograms of the breast can also help radiologists to evaluate some lumps that can be felt but are hard to see on a mammogram, especially in the dense breasts of young women. Unlike mammography, ultrasound cannot detect

the microcalcifications that sometimes indicate cancer, nor does it pick up small tumors.

CT Scanning

Computed tomography, or **CT scanning,** uses a computer to organize and stack the information from multiple x-ray, cross-sectional views of a body's organ or area. The scans are made by having the source of an x-ray beam rotate around the patient. X-rays passing through the body are detected by sensors that pass the information to computers. Once processed, the information is displayed as an image on a video screen. CT can separate overlapping structures precisely and is sometimes helpful in locating breast abnormalities that are difficult to pinpoint with mammography or ultrasound—for instance, a tumor that is so close to the chest wall that it shows up in only one mammographic view.

Research on New Techniques

Several new techniques for imaging the breast are in the research stage. These include the use of **magnetic resonance imaging (MRI)** and **positron emission tomography (PET scanning)** to identify tissues that are abnormally active. MRI uses a large magnet to surround the patient along with radio frequencies and a computer to produce its images. PET scanning uses signals from radioactive traces to construct images. **Laser beam scanning** shines a powerful laser beam through the breast, while a special camera on the far side of the breast records the image.

Researchers are also striving to improve the detection power and diagnostic accuracy of mammography. **Digital mammography** is a technique for recording x-ray images in computer code, improving the detection of breast abnormalities. **Computer-aided diagnosis,**

or **CAD**, uses special computer programs to scan mammographic images and alert radiologists to areas that look suspicious.

Finally, medical researchers are exploring the use of biological tests to detect **tumor markers** for breast cancer in blood, urine, or nipple aspirates.

Gene Testing for Breast Cancer Susceptibility

A breast cell progresses from normal to cancerous through a series of several distinct changes, each one controlled by a different gene or set of genes. Researchers have precisely located the **BRCA1** and **BRCA2 genes,** key regions within a woman's **chromosomes** that control cell growth in breast tissue. A woman can inherit a **mutation**, an alteration in these genes that are essential for normal growth of breast cells, and this inherited change may put her at greater risk for eventually developing breast cancer. The recent identification of **genetic changes** in BRCA1 and BRCA2 makes a gene test possible.

Scientists estimate that alterations in the BRCA1 and BRCA2 genes may be responsible for about 5 to 10 percent of all the cases of breast cancer and for about 25 percent of the cases in women under the age of 30. BRCA1 mutation testing is primarily done in certain families whose members are inclined to develop breast cancer at an early age because of an inherited change. Special counseling programs occur before and after the testing to inform women about the possible consequences of receiving test results. It is hoped that these genetic tests may one day enable scientists to delay or prevent breast cancer in high-risk families. Positive results may enable careful watchfulness when appropriate; negative results may reassure those women in high-risk families who are at no greater than average risk for breast cancer.

Scientists at NCI and elsewhere believe that tests for alterations in genes that control growth in breast tissue and in other genes throughout the body require careful study to establish their appropriate use. In addition to BRCA1 and BRCA2, other genes and the proteins they control may be involved in breast cancer, and much more needs to be learned about the risk associated with particular genetic alterations. NCI supports research on the development of new genetic tests offered within a research setting and accompanied by genetic counseling. Counseling is important because test results must be properly understood, and a counselor can help persons with a positive test to handle possible discrimination in health or life insurance or in the workplace.

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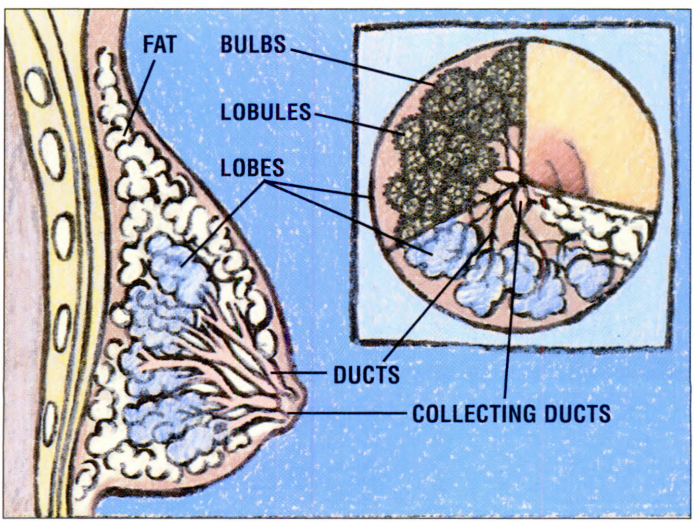
Menu

About Breast Lumps and Other Changes

Over her lifetime, a woman can encounter a broad variety of breast conditions. These include normal changes that occur during the **menstrual cycle** as well as several types of benign lumps. What they have in common is that they are not cancer. Even for breast lumps that require a biopsy, some 80 percent prove to be benign.

Each breast has 15 to 20 sections, called **lobes,** each with many smaller **lobules.** The lobules end in dozens of tiny **bulbs** that can produce milk. Lobes, lobules, and bulbs are all linked by thin tubes called **ducts.** These ducts lead to the nipple, which is centered in a dark area of skin called the **areola.** The spaces between the lobules and ducts are filled with fat. There are no muscles in the breast, but muscles lie under each breast and cover the ribs.



The breast's milk-producing system consists of lobes, lobules, and bulbs, all linked by thin tubes called ducts.

These normal features can sometimes make the breasts feel lumpy, especially in women who are thin or who have small breasts.

In addition, from the time a girl begins to menstruate, her breasts undergo regular changes each month. Many doctors believe that nearly all breasts develop some lasting changes, beginning when the woman is about 30 years old. Eventually, about half of all women will experience symptoms such as lumps, pain, or **nipple discharge**. Generally these disappear with menopause.

Some studies show that the chances of developing **benign breast changes** are higher for a woman who has never had children, has irregular menstrual cycles, or has a family history of breast cancer. Benign breast conditions are less common among women who take birth control pills or who are overweight. Because they generally involve the glandular tissues of the breast, benign breast conditions are more of a problem for women of child-bearing age, who have more glandular breasts.

Types of Benign Breast Changes

Common benign breast changes fall into several broad categories. These include generalized breast changes, solitary lumps, nipple discharge, and **infection** and/or **inflammation**.

Generalized Breast Changes

Generalized breast lumpiness is known by several names, including **fibrocystic disease** changes and benign breast disease. Such lumpiness, which is sometimes described as "ropy" or "granular," can often be felt in the area around the nipple and areola and in the upper-outer part of the breast. Such lumpiness may become more obvious

as a woman approaches middle age and the milk-producing glandular tissue of her breasts increasingly gives way to soft, fatty tissue. Unless she is taking replacement hormones, this type of lumpiness generally disappears for good after **menopause**.

The menstrual cycle also brings **cyclic breast changes**. Many women experience swelling, tenderness, and pain before and sometimes during their periods. At the same time, one or more lumps or a feeling of increased lumpiness may develop because of extra fluid collecting in the breast tissue. These lumps normally go away by the end of the period.

During pregnancy, the milk-producing glands become swollen and the breasts may feel lumpier than usual. Although very uncommon, breast cancer has been diagnosed during pregnancy. If you have any questions about how your breasts feel or look, talk to your doctor.

Solitary Lumps

Benign breast conditions also include several types of distinct, solitary lumps. Such lumps, which can appear at any time, may be large or small, soft or rubbery, fluid-filled or solid.

Cysts are fluid-filled sacs. They occur most often in women ages 35 to 50, and they often enlarge and become tender and painful just before the menstrual period. They are usually found in both breasts. Some cysts are so small they cannot be felt; rarely, cysts may be several inches across. Cysts are usually treated by observation or by fine needle aspiration. They show up clearly on ultrasound.
(See *Aspirating a Cyst*, page 28.)

Fibroadenomas are solid and round benign tumors that are made up of both structural (fibro) and glandular (adenoma) tissues. Usually,

these lumps are painless and found by the woman herself. They feel rubbery and can easily be moved around. Fibroadenomas are the most common type of tumors in women in their late teens and early twenties, and they occur twice as often in African-American women as in other American women.

Fibroadenomas have a typically benign appearance on mammography (smooth, round masses with a clearly defined edge), and they can sometimes be diagnosed with fine needle aspiration. Although fibroadenomas do not become malignant, they can enlarge with pregnancy and breast-feeding. Most surgeons believe that it is a good idea to remove fibroadenomas to make sure they are benign.

Fat necrosis is the name given to painless, round, and firm lumps formed by damaged and disintegrating fatty tissues. This condition typically occurs in obese women with very large breasts. It often develops in response to a bruise or blow to the breast, even though the woman may not remember the specific injury. Sometimes the skin around the lumps looks red or bruised. Fat necrosis can easily be mistaken for cancer, so such lumps are removed in a surgical biopsy. (See *Biopsy*, page 29.)

Sclerosing adenosis is a benign condition involving the excessive growth of tissues in the breast's lobules. It frequently causes breast pain. Usually the changes are microscopic, but adenosis can produce lumps, and it can show up on a mammogram, often as calcifications. Short of biopsy, adenosis can be difficult to distinguish from cancer. The usual approach is surgical biopsy, which furnishes both diagnosis and treatment.

Nipple Discharge

Nipple discharge accompanies some benign breast conditions. Since the breast is a gland, secretions from the nipple of a mature woman are not unusual, nor even necessarily a sign of disease. For example, small amounts of discharge commonly occur in women taking birth control pills or certain other medications, including sedatives and tranquilizers. If the discharge is being caused by a disease, the disease is more likely to be benign than cancerous.

Nipple discharges come in a variety of colors and textures. A milky discharge can be traced to many causes, including thyroid malfunction and oral contraceptives or other drugs. Women with generalized breast lumpiness may have a sticky discharge that is brown or green.

The doctor will take a sample of the discharge and send it to a laboratory to be analyzed. Benign sticky discharges are treated chiefly by keeping the nipple clean. A discharge caused by infection may require antibiotics.

One of the most common sources of a bloody or sticky discharge is an **intraductal papilloma,** a small, wartlike growth that projects into breast ducts near the nipple. Any slight bump or bruise in the area of the nipple can cause the papilloma to bleed. Single (solitary) intraductal papillomas usually affect women nearing menopause. If the discharge becomes bothersome, the diseased duct can be removed surgically without damaging the appearance of the breast. Multiple intraductal papillomas, in contrast, are more common in younger women. They often occur in both breasts and are more likely to be associated with a lump than with nipple discharge. Multiple intraductal papillomas, or any papillomas associated with a lump, need to be removed.

Infection and/or Inflammation

Infection and/or inflammation, including **mastitis** and **mammary duct ectasia**, are characteristic of some benign breast conditions.

Mastitis (sometimes called "postpartum mastitis") is an infection most often seen in women who are breast-feeding. A duct may become blocked, allowing milk to pool, causing inflammation, and setting the stage for infection by bacteria. The breast appears red and feels warm, tender, and lumpy.

In its earlier stages, mastitis can be cured by antibiotics. If a pus-containing **abscess** forms, it will need to be drained or surgically removed.

Mammary duct ectasia is a disease of women nearing menopause. Ducts beneath the nipple become inflamed and can become clogged. Mammary duct ectasia can become painful, and it can produce a thick and sticky discharge that is grey to green in color. Treatment consists of warm compresses, antibiotics, and, if necessary, surgery to remove the duct.

~ A word of caution: If you find a lump or other change in your breast, don't use this booklet to try to diagnose it yourself. There is no substitute for a doctor's evaluation.~

Benign Breast Conditions and the Risk for Breast Cancer

Most benign breast changes do not increase a woman's risk for getting cancer. Recent studies show that only certain very specific types of microscopic changes put a woman at higher risk. These changes feature excessive cell growth, or **hyperplasia**.

About 70 percent of the women who have a biopsy showing a benign condition have *no* evidence of hyperplasia. **These women are at no increased risk for breast cancer**.

About 25 percent of benign breast biopsies show signs of hyperplasia, including conditions such as intraductal papilloma and sclerosing adenosis. Hyperplasia *slightly* increases the risk of developing breast cancer.

The remaining 5 percent of benign breast biopsies reveal both excessive cell growth—hyperplasia—and cells that are abnormal—atypia. A diagnosis of atypical hyperplasia, as it is called, *moderately* increases breast cancer risk.

If You Find a Lump

If you discover a lump in one breast, check the other breast. If both breasts feel the same, the lumpiness is probably normal. You should, however, mention it to your doctor at your next visit.

But if the lump is something new or unusual and does not go away after your next menstrual period, it is time to call your doctor. The same is true if you discover a discharge from the nipple or skin changes such as dimpling or puckering. If you do not have a doctor, your local medical society may be able to help you find one in your area.

You should not let fear delay you. It is natural to be concerned if you find a lump in your breast. But remember that four-fifths of all breast lumps are not cancer. The sooner any problem is diagnosed, the sooner you can have it treated.

Clinical Evaluation

No matter how your breast lump was discovered, the doctor will want to begin with your medical history. What symptoms do you have and how long have you had them? What is your age, menstrual status, general health? Are you pregnant? Are you taking any medications? How many children do you have? Do you have any relatives with benign breast conditions or breast cancer? Have you previously been diagnosed with benign breast changes?

The doctor will then carefully examine your breasts and will probably schedule you for a diagnostic mammogram, to obtain as much information as possible about the changes in your breast. This may be either a lump that can be felt or an abnormality discovered on a screening mammogram. Diagnostic mammography may include additional views or use special techniques to magnify a suspicious area or to eliminate shadows produced by overlapping layers of normal breast tissue. The doctor will want to compare the diagnostic mammograms with any previous mammograms. If the lump appears to be a cyst, your doctor may ask you to have a sonogram (ultrasound study).

Aspirating a Cyst

When a cyst is suspected, some doctors proceed directly with aspiration. This procedure, which uses a very thin needle and a syringe, takes only a few minutes and can be done in the doctor's office. The procedure is not usually very uncomfortable, since most of the nerves in the breast are in the skin.

Holding the lump steady, the doctor inserts the needle and attempts to draw out any fluid. If the lump is indeed a cyst, removing the fluid will cause the cyst to collapse and the lump to disappear. Unless the

cyst reappears in the next week or two, no other treatment is needed. If the cyst reappears at a later date, it can simply be drained again.

If the lump turns out to be solid, it may be possible to use the needle to withdraw a clump of cells, which can then be sent to a laboratory for further testing. (Cysts are so rarely associated with cancer that the fluid removed from a cyst is not usually tested unless it is bloody or the woman is older than 55 years of age.)

Biopsy

The only certain way to learn whether a breast lump or mammographic abnormality is cancerous is by having a biopsy, a procedure in which tissue is removed by a surgeon or other specialist and examined under a microscope by a **pathologist.** A pathologist is a doctor who specializes in identifying tissue changes that are characteristic of disease, including cancer.

Tissue samples for biopsy can be obtained by either surgery or needle. The doctor's choice of biopsy technique depends on such things as the nature and location of the lump, as well as the woman's general health.

Surgical biopsies can be either excisional or incisional. An **excisional biopsy** removes the entire lump or suspicious area. Excisional biopsy is currently the standard procedure for lumps that are smaller than an inch or so in diameter. In effect, it is similar to a **lumpectomy**, surgery to remove the lump and a margin of surrounding tissue. Lumpectomy is usually used in combination with radiation therapy as the basic treatment for early breast cancer.

An excisional biopsy is typically performed in the outpatient department of a hospital. A local anesthetic is injected into the woman's

breast. Sometimes she is given a tranquilizer before the procedure. The surgeon makes an incision along the contour of the breast and removes the lump along with a small margin of normal tissue. Because no skin is removed, the biopsy scar is usually small. The procedure typically takes less than an hour. After spending an hour or two in the recovery room, the woman goes home the same day.

An **incisional biopsy** removes only a portion of the tumor (by slicing into it) for the pathologist to examine. Incisional biopsies are generally reserved for tumors that are larger. They too are usually performed under local anesthesia, with the woman going home the same day.

Whether or not a surgical biopsy will change the shape of your breast depends partly on the size of the lump and where it is located in the breast, as well as how much of a margin of healthy tissue the surgeon decides to remove. You should talk with your doctor beforehand, so you understand just how extensive the surgery will be and what the cosmetic result will be.

Needle biopsies can be performed with either a very fine needle or a cutting needle large enough to remove a small nugget of tissue.

- **Fine needle aspiration** uses a very thin needle and syringe to remove either fluid from a cyst or clusters of cells from a solid mass. Accurate fine needle aspiration biopsy of a solid mass takes great skill, gained through experience with numerous cases.

- **Core needle biopsy** uses a somewhat larger needle with a special cutting edge. The needle is inserted, under local anesthesia, through a small incision in the skin, and a small core of tissue is removed. This technique may not work well for lumps that are very hard or very small. Core needle biopsy may cause some bruising,

but rarely leaves an external scar, and the procedure is over in a matter of minutes.

At some institutions with extensive experience, aspiration biopsy is considered as reliable as surgical biopsy; it is trusted to confirm the **malignancy** of a clinically suspicious mass or to confirm a diagnosis that a lump is not cancerous. Should the needle biopsy results be uncertain, the diagnosis is pursued with a surgical biopsy. Some doctors prefer to verify all aspiration biopsy results with a surgical biopsy before proceeding with treatment.

Localization biopsy (also known as needle localization) is a procedure that uses mammography to locate and a needle to biopsy breast abnormalities that can be seen on a mammogram but cannot be felt (nonpalpable abnormalities). Localization can be used with surgical biopsy, fine needle aspiration, or core needle biopsy.

For a surgical biopsy, the radiologist locates the abnormality on a mammogram (or a sonogram) just prior to surgery. Using the mammogram as a guide, the radiologist inserts a fine needle or wire so the tip rests in the suspicious area—typically, an area of microcalcifications. The needle is anchored with a gauze bandage, and a second mammogram is taken to confirm that the needle is on target.

The woman, along with her mammograms, goes to the operating room, where the surgeon locates and cuts out the needle-targeted area. The more precisely the needle is placed, the less tissue needs to be removed.

Sometimes the surgeon will be able to feel the lump during surgery. In other cases, especially where the mammogram showed only microcalcifications, the abnormality can be neither seen nor felt. To

make sure the surgical specimen in fact contains the abnormality, it is x-rayed on the spot. If this **specimen x-ray** fails to show the mass or the calcifications, the surgeon is able to remove additional tissue.

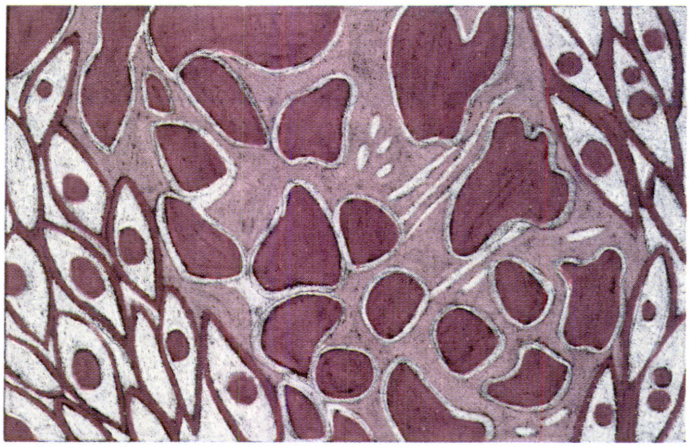
Stereotactic localization biopsy is a newer approach that relies on a three-dimensional x-ray to guide the needle biopsy of a nonpalpable mass. With one type of equipment, the patient lies face down on an examining table with a hole in it that allows the breast to hang through; the x-ray machine and the maneuverable needle "gun" are set up underneath. Alternatively, specialized stereotactic equipment can be attached to a standard mammography machine.

The breast is x-rayed from two different angles, and a computer plots the exact position of the suspicious area. (Because only a small area of the breast is exposed to the radiation, the doses are similar to those from standard mammography.) Once the target is clearly identified, the radiologist positions the gun and advances the biopsy needle into the lesion.

Tissue Studies

The cells or tissue removed through needle or surgical biopsy are promptly sent (along with the x-ray of the specimen, if one was made) to the pathology lab. If the excised lump is large enough, the pathologist can take a preliminary look by quick-freezing a small portion of the tissue sample. This makes the sample firm enough to slice into razor-thin sections that can be examined under the microscope. A "**frozen section**" provides an immediate, if provisional, diagnosis, and the surgeon may be able to give you the results before you go home.

The results of a frozen section are not 100 percent certain, however. A more thorough assessment takes several days, while the pathologist



The pathologist examines the slide, looking for changes in the breast cells that may be indicative of breast cancer.

processes "**permanent sections**" of tissue that can be examined in greater detail.

When the biopsy specimen is small—as is often the case when the abnormality consists of mammographic calcifications only—many doctors prefer to bypass a frozen section so the tiny specimen can be analyzed in its entirety.

The pathologist looks for abnormal cell shapes and unusual growth patterns. In many cases the diagnosis will be clear-cut. However, the distinctions between benign and cancerous can be subtle, and even experts don't always agree. When in doubt, pathologists readily consult their colleagues. If there is any question about the results of your biopsy, you will want to make sure your biopsy slides have been reviewed by more than one pathologist.

Deciding To Biopsy

Not every lump or mammographic change merits a biopsy. Nearly all mammographic masses that look smooth and clearly outlined, for instance, are benign. Your doctor needs to thoughtfully weigh the

findings from your physical exam and mammogram along with your background and your medical history when making a recommendation about a biopsy.

~ In general, doctors feel it is wise to biopsy any distinct and persistent lump. ~

Although benign lumps rarely, if ever, turn into cancer, cancerous lumps can develop near benign lumps and can be hidden on a mammogram. Even if you have had a benign lump removed in the past, you cannot be sure any new lump is also benign.

In some cases, the doctor may suggest watching the suspicious area for a month or two. Because many lumps are caused by normal hormonal changes, this waiting period may provide additional information.

Similarly, if the changes on your mammogram show all the signs of benign disease, your doctor may advise waiting several months and then taking another mammogram. This would be followed by more diagnostic mammograms over the next 3 years. If you choose this option, however, you must be strongly committed to regularly scheduled followups.

If you feel uncomfortable about waiting, express your concerns to your doctor. You may also want to get a second opinion, perhaps from a breast specialist or surgeon. Many cities have breast clinics where you can get a second opinion.

Biopsy: One Step or Two?

Not too many years ago, all women undergoing surgery for breast symptoms had a **one-step procedure**: If the surgical biopsy showed cancer, the surgeon performed a **mastectomy** immediately. The

woman went into surgery not knowing if she had cancer or if her breast would be removed.

Today a woman facing biopsy has a broader range of options. In most cases, biopsy and diagnosis will be separated from any further treatment by an interval of several days or weeks. Such a **two-step procedure** does not harm the patient, and it has several benefits. It allows time for the tissue sample to be examined in detail and, if cancer is found, it gives the woman time to adjust to the diagnosis. She can review her treatment options, seek a second opinion, receive counseling, and arrange her schedule.

Some women, nonetheless, prefer a one-step procedure. They have decided beforehand that, if the surgical biopsy and frozen section show cancer, they want to go ahead with surgery, either mastectomy or lumpectomy and axillary dissection (removal of the underarm lymph nodes). If, on the other hand, the lump proves to be benign, the incision will be closed. The procedure will have taken less than an hour, and the woman may go home the same day or the next day.

A one-step procedure avoids the physical and psychological stress, as well as the costs in time and money, of two rounds of surgery and anesthesia—a particularly important consideration for women who are ill or frail. Women who have symptoms of breast cancer can find the wait between biopsy and surgery emotionally draining, and they may be relieved to have a one-step procedure to take care of the problem as quickly as possible.

No single solution is right for everyone. Each woman should consult with her doctors and her family, weigh the alternatives, and decide what approach is appropriate. Being involved in the decision-making process can give a woman a sense of control over her body and her life.

Prevention Research

Many of the factors that influence your chances of developing breast cancer—your age or inheritance of a breast cancer susceptibility gene—are beyond your control. Others present opportunities for change, and several large research studies are looking at possibilities for intervention—changing medication, diet, or behavior to prevent or delay onset of disease.

The Breast Cancer Prevention Trial is a randomized study of **tamoxifen**, a drug that has been widely used in the treatment of women with breast cancer. Because tamoxifen, when taken for 5 years, has been found to markedly reduce the occurrence of new cancers in the opposite breast of a woman who has already had breast cancer, it is now being tried as a prevention treatment in healthy women at increased risk for breast cancer either because they are age 60 or older, or because they are between the ages of 30 and 59 and have combinations of high-risk factors.

Nutrient **chemoprevention** is being tested in research studies in Italy, where women who have already been treated for breast cancer are taking 4-HPR, a synthetic form of vitamin A, in hopes of preventing cancer in the opposite breast. Other researchers are investigating the protective potential of several other vitamins, including C and E. Yet other scientists are checking out naturally occurring chemicals, called **phytochemicals,** found in common fruits, vegetables, and other edible plants, in hopes of finding cancer-fighting substances that can be extracted, purified, and added to our diets.

Diet itself is another target of prevention research. In the Women's Health Initiative, a project of the National Institutes of Health, 70,000 women over age 50 are enrolled in a series of clinical studies to measure the effectiveness of prevention strategies for coronary heart disease, cancer, and **osteoporosis.** Strategies under study include a low-fat diet (less than 20 percent of calories from fat) and calcium plus vitamin D supplements, along with **hormone replacement therapy.** Another large study evaluating a low-fat diet in high-risk women is under way in Canada.

A much more drastic approach to breast cancer prevention is surgery to remove both breasts. Such a procedure, known as **prophylactic mastectomy**, is sometimes chosen by women with a very high risk for breast cancer—for instance, carrying a genetic mutation in BRCA1 or BRCA2, having a mother and one or more sisters with premenopausal breast cancer, plus a diagnosis of atypical hyperplasia and a history of several breast biopsies.

Unless a woman finds that anxiety is undermining the quality of her life, she is usually counseled not to choose this physically and psychologically draining surgery. The vast majority of breasts removed prophylactically show no signs of cancer. Moreover, since even a total mastectomy can leave a small amount of breast tissue behind, it cannot guarantee the woman will remain cancer-free. The preferred approach for most high-risk women is careful watching with clinical breast exams and mammography once or twice a year.

If you are considering a prophylactic mastectomy, with or without subsequent breast reconstruction, you will want to get a second

opinion, preferably from a breast specialist. There is seldom reason to rush your decision. Many doctors advise a woman to give herself several months to weigh the options.

If your risk for breast cancer is high, you might also consider talking with a genetic counselor about gene testing for breast cancer susceptibility. (See *Gene Testing*, page 18.)

Steps To Take

Whether your risk of breast cancer is average or higher, there are some steps you can take:

- Follow early detection practices. Ask your doctor when you should begin mammograms at regular intervals. Get regular breast exams by a doctor or nurse.
- Consult your doctor about your personal situation and carefully weigh any potential risks against the benefits in making decisions about hormone-containing drugs. Stay informed as new research findings become available.
- Exercise and eat a balanced diet that provides a good variety of nutrients and plenty of fiber. Limit dietary fat and alcohol. These are good health measures that make sense for everyone.

Questions To Ask Your Doctor

We hope this booklet has answered many of your questions about breast changes and the early detection of breast cancer. However, no booklet can take the place of talking with your doctor. Take any questions you have to your doctor. If you don't understand the answer, ask her or him to explain further.

Many women find it helpful to write down their questions ahead of time. Here is a list of some of the most common questions that women have. You may have others. Jot them down as you think of them, and take the list with you when you see your doctor.

- How often should I schedule appointments with you?
- How can I tell which lumps are not normal?
- What kind of lumps do I have?
- Do I need to have a mammogram? When? How often? Or if not, why not?
- Is there anything in my background that indicates I should have mammograms more often than your usual recommendations?
- Where should I have my mammogram?
- Did you receive the results of my mammogram? What does the report mean?

Glossary

Abscess: A pocket of pus that forms as the body's defenses attempt to wall off infection-causing germs.

Areola: The colored tissue that encircles the nipple.

Aspiration: Removal of fluid from a cyst or cells from a lump, using a needle and syringe.

Atypical hyperplasia: Cells that are both abnormal (atypical) and increased in number. Benign microscopic breast changes known as atypical hyperplasia moderately increase a woman's risk of developing breast cancer.

Average risk (for breast cancer): A measure of the chances of getting breast cancer without the presence of any specific factors known to be associated with the disease.

Benign: Not cancerous; cannot invade neighboring tissues or spread to other parts of the body.

Benign breast changes: Noncancerous changes in the breast. Benign breast conditions can cause pain, lumpiness, nipple discharge, and other problems.

Biopsy: The removal of a sample of tissue or cells for examination under a microscope for purposes of diagnosis.

BRCA1 and **BRCA2 genes:** The principal genes that, when altered, indicate an inherited susceptibility to breast cancer. These gene alterations are present in 80 to 90 percent of hereditary cases of breast cancer.

Breast density: Glandular tissue in the breast common in younger women, making it difficult for mammography to detect breast cancer.

Breast implants: Silicone rubber sacs, which are filled with silicone gel or sterile saline, used for breast reconstruction after mastectomy.

Calcifications: Small deposits of calcium in tissue, which can be seen on mammograms.

Cancer: A general name for more than 100 diseases in which abnormal cells grow out of control. Cancer cells can invade and destroy healthy tissues, and they can spread through the bloodstream and the **lymphatic system** to other parts of the body.

Carcinoma: Cancer that begins in tissues lining or covering the surfaces (epithelial tissues) of organs, glands, or other body structures. Most cancers are carcinomas.

Carcinoma in situ: Cancer that is confined to the cells where it began, and has not spread into surrounding tissues.

Chemoprevention: The use of drugs or vitamins to prevent cancer in people who have precancerous conditions or a high risk of cancer, or to prevent the recurrence of cancer in people who have already been treated for it.

Chromosomes: Structures located in the nucleus of a cell, containing genes.

Clinical breast exam: A physical examination by a doctor or nurse of the breast, underarm, and collarbone area, first on one side, then on the other.

Computed tomography (CT) scanning: An imaging technique that uses a computer to organize the information from multiple x-ray views and construct a cross-sectional image of areas inside the body.

Computer-aided diagnosis (CAD): the use of special computer programs to scan mammographic images and flag areas that look suspicious.

Core needle biopsy: The use of a small cutting needle to remove a core of tissue for microscopic examination.

Cyclic breast changes: Normal tissue changes that occur in response to the changing levels of female hormones during the menstrual cycle. Cyclic breast changes can produce swelling, tenderness, and pain.

Cyst: Fluid-filled sac. Breast cysts are benign.

Diagnostic mammogram: The use of a breast x-ray to evaluate the breasts of a woman who has symptoms of disease such as a lump, or whose screening mammogram shows an abnormality.

Digital mammography: A technique for recording x-ray images in computer code, which allows the information to enhance subtle, but potentially significant, changes.

Ducts: Channels that carry body fluids. Breast ducts transport milk from the breast's lobules out to the nipple.

Ductal carcinoma in situ (DCIS): Cancer that is confined to the ducts of the breast tissue.

Excisional biopsy: The surgical removal (excision) of an abnormal area of tissue, usually along with a margin of healthy tissue, for microscopic examination. Excisional biopsies remove the entire lump from the breast.

False negative (mammograms): Breast x-rays that miss cancer when it is present.

False positive (mammograms): Breast x-rays that indicate breast cancer is present when the disease is truly absent.

Fat necrosis: Lumps of fatty material that form in response to a bruise or blow to the breast.

Fibroadenoma: Benign breast tumor made up of both structural (fibro) and glandular (adenoma) tissues.

Fibrocystic disease: See **Generalized breast lumpiness**.

Fine needle aspiration: The use of a slender needle to remove fluid from a cyst or clusters of cells from a solid lump.

Frozen section: A sliver of frozen biopsy tissue. A frozen section provides a quick preliminary diagnosis but is not 100 percent reliable.

Generalized breast lumpiness: Breast irregularities and lumpiness, commonplace and noncancerous. Sometimes called "fibrocystic disease" or "benign breast disease."

Gene: Segment of a DNA molecule and the fundamental biological unit of heredity.

Genetic change: An alteration in a segment of DNA, which can disturb a gene's behavior and sometimes leads to disease.

Phar Nurs-HSCI

Higher risk (for breast cancer): A measure of the chances of getting breast cancer when factor(s) known to be associated with the disease are present.

Hormone replacement therapy: Hormone-containing medications taken to offset the symptoms and other effects of the hormone loss that accompanies menopause.

Hormones: Chemicals produced by various glands in the body, which produce specific effects on specific target organs and tissues.

Hyperplasia: Excessive growth of cells. Several types of benign breast conditions involve hyperplasia.

Incisional biopsy: The surgical removal of a portion of an abnormal area of tissue, by cutting into (incising) it, for microscopic examination.

Infection: Invasion of body tissues by microorganisms such as bacteria and viruses.

Infiltrating cancer: Cancer that has spread to nearby tissue, lymph nodes under the arm, or other parts of the body. (Same as **Invasive cancer**.)

Inflammation: The body's protective response to injury (including infection). Inflammation is marked by heat, redness, swelling, pain, and loss of function.

Intraductal papilloma: A small wartlike growth that projects into a breast duct.

Invasive cancer: Cancer that has spread to nearby tissue, lymph nodes under the arm, or other parts of the body. (Same as **Infiltrating cancer**.)

Laser beam scanning: a technology being studied in research for breast cancer detection that shines a laser beam through the breast and records the image produced, using a special camera.

Lobes, lobules, bulbs: Milk-producing tissues of the breast. Each of the breast's 15 to 20 lobes branches into smaller lobules, and each lobule ends in scores of tiny bulbs. Milk originates in the bulbs and is carried by ducts to the nipple.

Localization biopsy: The use of mammography to locate tissue containing an abnormality that can be detected only on mammograms, so it can be removed for microscopic examination.

Lumpectomy: Surgery to remove only the cancerous breast lump; usually followed by radiation therapy.

Lymphatic system: The tissues and organs that produce, store, and transport cells that fight infection and disease.

Macrocalcifications: Coarse calcium deposits. They are most likely due to aging, old injuries, or inflammations and usually are associated with benign conditions.

Magnetic resonance imaging (MRI): A technique that uses a powerful magnet linked to a computer to create detailed pictures of areas inside the body.

Malignancy: State of being cancerous. Malignant tumors can invade surrounding tissues and spread to other parts of the body.

Mammary duct ectasia: A benign breast condition in which ducts beneath the nipple become dilated and sometimes inflamed, and which can cause pain and nipple discharge.

Mammogram: An x-ray of the breast.

Mammography: The examination of breast tissue using x-rays.

Mastectomy: Surgery to remove the breast (or as much of the breast as possible).

Mastitis: Infection of the breast. Mastitis is most often seen in nursing mothers.

Menopause: The time when a woman's monthly menstrual periods cease. Menopause is sometimes called the "change of life."

Menstrual cycle: The monthly cycle of discharge, during a woman's reproductive years, of blood and tissues from the uterus.

Microcalcifications: Tiny deposits of calcium in the breast, which can show up on a mammogram. Certain patterns of microcalcifications are sometimes a sign of breast cancer.

Mutation: A change in the number, arrangement, or molecular sequence of a gene.

Needle biopsy: Use of a needle to extract cells or bits of tissue for microscopic examination.

Nipple discharge: Fluid coming from the nipple.

Nonpalpable cancer: Cancer in breast tissue that can be seen on mammograms but that cannot be felt.

One-step procedure: Biopsy and surgical treatment combined into a single operation.

Osteoporosis: A condition of mineral loss that causes a decrease in bone density and an enlargement of bone spaces, producing bone fragility.

Palpation: Use of the fingers to press body surfaces, so as to feel tissues and organs underneath. Palpating the breast for lumps is a crucial part of a physical breast examination.

Pathologist: A doctor who diagnoses disease by studying cells and tissues under a microscope.

Permanent section: Biopsy tissue specially prepared and mounted on slides so that it can be examined under a microscope by a pathologist.

Phytochemicals: Naturally occurring chemicals found in plants that may be important nutrients for reducing a person's cancer risk.

Positron emission tomography (PET scanning): A technique that uses signals emitted by radioactive tracers to construct images of the distribution of the tracers in the human body.

Prophylactic mastectomy: Surgery to remove a breast that is not known to contain breast cancer, for the purpose of reducing an individual's cancer risk.

Rad: A unit of measure for radiation. It stands for **r**adiation **a**bsorbed **d**ose.

Radiation: Energy carried by waves or by streams of particles. Various forms of radiation can be used in low doses to diagnose disease and in high doses to treat disease. See **X-rays**.

Radiologist: A doctor with special training in the use of x-rays (and related technologies such as ultrasound) to image body tissues and to treat disease.

Risk: A measure of the likelihood of some uncertain or random event with negative consequences for human life or health.

Risk factors (for cancer): Conditions or agents that increase a person's chances of getting cancer. Risk factors do not necessarily cause cancer; rather, they are indicators, statistically associated with an increase in likelihood.

Sclerosing adenosis: A benign breast disease that involves the excessive growth of tissues in the breast's lobules.

Screening mammogram: Breast x-ray used to look for signs of disease such as cancer in people who are symptom-free.

Sonogram: The image produced by ultrasound.

Specimen x-ray: An x-ray of tissue that has been surgically removed (surgical specimen).

Stereotactic localization biopsy: A technique that employs three-dimensional x-ray to pinpoint a specific target area. It is used in conjunction with needle biopsy of nonpalpable breast abnormalities.

Surgical biopsy: The surgical removal of tissue for microscopic examination and diagnosis. Surgical biopsies can be either excisional or incisional. (See **Excisional biopsy** and **Incisional biopsy**.)

Tamoxifen: A hormonally related drug that has been used to treat breast cancer and is being tested as a possible preventive strategy.

Tumor: An abnormal growth of tissue. Tumors may be either benign or cancerous.

Tumor markers: Proteins (either amounts or unique variants) made by altered genes in cancer cells that are involved in the progression of the disease.

Two-step procedure: Biopsy and treatment done in two stages, usually a week or two apart.

Ultrasound: The use of sound waves to produce images of body tissues.

X-ray: A high-energy form of radiation. X-rays form an image of body structures by traveling through the body and striking a sheet of film. Breast x-rays are called mammograms.

BREAST
CANCER
INFO

Resources

Information about cancer is available from the sources listed below. You may wish to check for additional information at your local library or bookstore and from support groups in your community. Another option may be to use your computer to access the Internet and visit the NCI website for patients and the public at **http://rex.nci.nih.gov**.

National Cancer Institute (NCI)

The National Cancer Institute is the principal federal agency working to prevent cancer and help patients live longer and healthier lives. Drawing on the knowledge and expertise of researchers at laboratories, cancer centers, and universities across the country, NCI strives to conduct and sponsor research and translate the results into information that will continue to benefit everyone.

Cancer Information Service (CIS)

The Cancer Information Service, a national information and education network, is a free public service of NCI. The CIS meets the information needs of patients, the public, and health professionals. Specially trained staff provide the latest scientific information in understandable language, as well as a list of mammography facilities organized by state. CIS staff answers questions in English and Spanish and distributes NCI materials. The toll-free telephone number for the CIS is 1-800-4-CANCER (1-800-422-6237). People with TTY equipment may call 1-800-332-8615.

PDQ

People who have cancer, their families, and doctors who care for cancer patients need timely and accurate information about cancer treatment. To meet these needs, NCI developed PDQ. This computer database gives both patients and doctors quick and easy access to the latest treatment information.

To use PDQ, doctors may use an office computer or the services of a medical library. By calling the CIS at 1-800-4-CANCER, doctors and patients can get PDQ information and learn how to use this system.

American Cancer Society (ACS)

The American Cancer Society is a voluntary organization with local units all over the country. It supports research, conducts educational programs, and offers support groups and many other services to patients and their families. It also provides free booklets. To obtain information about services and activities in local areas, call the ACS's toll-free number, 1-800-ACS-2345 (1-800-227-2345) or the number listed under American Cancer Society in the white pages of the telephone book.

National Women's Health Information Center (NWHIC)

The National Women's Health Information Center, sponsored by the U.S. Public Health Service's Office on Women's Health and the Department of Defense, provides a centralized point of access to women's health information from the federal government and the private sector. To obtain information on breast cancer and other topics, call the NWHIC's toll-free number, 1-800-994-WOMAN.

Attention All Readers:

Please tell us what you think of this booklet.

1. The booklet was: ❑ easy to understand
   ❑ hard to understand

2. The information was: ❑ too much
   ❑ too little
   ❑ just the right amount

3. I would: ❑ recommend the booklet to other women
   ❑ NOT recommend the booklet to other women

4. I got this booklet from:
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   - ❑ nurse or other health professional
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   - ❑ calling 1-800-4-CANCER (NCI's Cancer Information Service)
   - ❑ calling 1-800-994-WOMAN (National Women's Health Information Center)
   - ❑ National Cancer Institute
   - ❑ U. S. Public Health Service's Office on Women's Health
   - ❑ American Cancer Society or ACS volunteer
   - ❑ other support group
   - ❑ family member or friend
   - ❑ other (please explain _____)

5. Did this booklet...
   - ❑ cover information that you needed?
   - ❑ help you understand breast changes better?
   - ❑ help you make decisions about your health?
   - ❑ help you in talking with your doctor?
   - ❑ help you in dealing with your feelings about breast cancer?

6. What is your age? _____

7. How far did you go in school?

❑ 8th grade or less ❑ some high school ❑ high school graduate
❑ some college ❑ college graduate ❑ graduate level education

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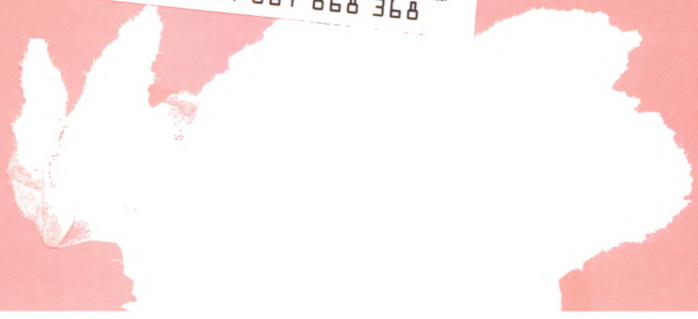

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Visit the NCI's Web site
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